

## GAME SYSTEM

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

5 The present invention relates to game systems for holding a racing game, such as a horse racing game, in which a plurality of players get together and use running objects to participate in the same race. More particularly, the present invention relates to a game system for progressing a race in accordance with ability parameters of running objects while changing the running parameters of the running objects.

The present application is based on Japanese Patent Application No. 2000-037291, which is incorporated herein by reference.

#### 2. Description of the Related Art

Concerning arcade game systems installed at game centers and the like, there are horse racing game systems simulating actual horse racing, cycle racing game systems simulating cycle racing, and track-and-field game systems simulating various track-and-field events and the like. In these types of game systems, a ring field (which may occasionally be referred to as a track) is formed on a board of a game machine, and a plurality of

running models are caused to run on the field. The running models compete with one another in order of arrival, and a player wins if the player correctly predicts a set of finishing places.

5 Recently, there are game systems in which the running models not only run on a predetermined course on the field in a predetermined direction, but also run on an arbitrary course on the field (Unexamined Japanese Patent Publication No. Hei. 10-94675 or the like). However, in the arcade game systems, there is no game which amuses a player by determining the relationship between operations by the player and field conditions, varying ability parameters of a running model in accordance with the determination result, and reflecting the varied ability parameters in a race.

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20 Unlike consumer games targeted for general game machines, arcade game systems in general are provided with game supplies and facilities which appeal to player's preferences, making complete devices to attract the player's attention. If such game systems can implement a new game by taking into consideration the foregoing interruption factors, variable factors of the ability parameters, and field conditions, the new game can appeal to the player more strongly, and hence the arcade is expected to be stimulated.

### SUMMARY OF THE INVENTION

In view of the above circumstances, it is an object of the present invention to provide a game system capable of implementing a new racing game in which interruption factors, variable factors of ability parameters, and field conditions are taken into consideration.

To solve the foregoing problems, according to a first aspect of the present invention, there is provided a game system which comprises a racing field formed on a predetermined board, and a running model, to which an inherent ability parameter varying in accordance with a given environment is assigned, caused to run a race on the racing field, wherein the racing field comprises a plurality of field regions in which the running model runs based on a current ability parameter, in accordance with the respective field regions.

The phrase "given environment" includes, for example, a training environment, a running environment, and the like. The phrase "the running model runs based on the current ability parameter, in accordance with the respective regions" means that, for example, in a particular region, importance is given not to a stamina parameter among running parameters, but is given to a speed

parameter. The reverse is applied to another region.

To solve the foregoing problems, according to a second aspect of the present invention, there is provided a game system which comprises a racing field formed on a predetermined board, and a running model, to which an inherent ability parameter varying in accordance with a given environment is assigned, caused to run a race on the racing field, wherein the racing field comprises a plurality of field regions which provide the running model with variable factors of the ability parameter, the variable factors differing in accordance with running of the running model in the respective field regions. With this arrangement, a player can confirm the contents of the ability parameter inherent in the running model, which varies in accordance with the running regions, thus enhancing the player's interest in the game.

To solve the foregoing problems, according to a third aspect of the present invention, there is provided a game system which comprises a racing field formed on a predetermined board, and a plurality of running models, to each of which an inherent ability parameter varying in accordance with a given environment is assigned, caused to run a race on the racing field, wherein the racing

field comprises a plurality of field regions in which each of the running models runs based on a current ability parameter in accordance with the respective field regions, whereby each of the running models is provided with variable factors of the ability parameter, the variable factors differing in accordance with running of each of the running models.

In the foregoing game systems, the field regions can include the following sets of:

(1) A region maintained so that the running model performs the steady running in which the current ability parameter of the running model is maximized and a region formed so as to obstruct the steady running;

(2) A flat region maintained not to obstruct the running of the running model and a region in which obstacles are arranged on part of a track on which the running model runs; and/or

(3) A region simulating a turf course and a region simulating a dirt course in which soil is exposed.

A passageway may be formed between the fields so that the running model can enter and exit, and the same running model can run on races on the plurality of field regions. Generally in this type of game system, a field region or field regions are determined in advance, and the type of running

model is determined in advance for each field region. In the game system of the present invention, only a single type of running model is necessary to use a plurality of field regions, and hence operating costs are reduced. Furthermore, a player can confirm the ability parameter of each running model by actually causing the running model to run on a plurality of fields, thus increasing pleasure in playing the game.

The present invention also provides a game system for forming a field using an electronical device, instead of mechanically constructing a field. The game system is a system for causing a running image, to which an inherent ability parameter whose value varies in accordance with a given environment is assigned, to run a race on an electronically-formed racing field image. The racing field includes a plurality of field regions in which the result of processing the current ability parameter using processes differing in accordance with the respective regions is reflected. The field regions provide the running image with variable factors of the ability parameter, the variable factors differing in accordance with the running. One of the field regions is a region simulating a turf course, and another one of the field regions is a region simulating a dirt course in which soil is exposed.

The condition of the turf in the region simulating the turf course and the condition of the soil in the region simulating the dirt course can be adjusted.

5            Preferably, each game system of the present invention may further include a game value adding device which adds a game value in accordance with the result of the race.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an external perspective view of a game system to which the present invention is applied;

Fig. 2 illustrates an example of a race selection screen among screens displayed according to the present embodiment;

Fig. 3 illustrates an example of a bet screen among the screens displayed according to the present embodiment; and

Fig. 4 is a functional diagram of a game progress control device according to the present embodiment.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment in which a game system of the present invention is applied to a horse racing game system is described below.

In the horse racing game system, the running ability of a racehorse, which is an example of a running model, is fostered in accordance with player's intentions. The running ability of the fostered racehorse is competed against the running abilities of other racehorses. The player is given a game value in accordance with the competition result.

A racehorse is a model having therein a control device for moving a running mechanism thereof. The internal control device is driven by a wireless signal transmitted from a game progress control device provided at the system side, thereby enabling the racehorse to run a race on a predetermined course.

Inherent ability parameters are assigned in advance to each racehorse, and the running ability changes in accordance with the ability parameters. The ability parameters include a group of multi-dimensional parameters including parameters indicating functions, such as a stamina parameter and a speed parameter, and parameters (numeric values) indicating arbitrary characteristics, such as weight, running ability, character, and the like. Each of these parameters changes in accordance with a given environment. Concerning variable factors, there are an adjusting environment, a running environment, and the like.

Although a player raises a racehorse selected by the player (changes the ability parameters of the racehorse), the player is initially not aware of how the racehorse will grow up. The player enjoys the growth process while giving various environments to the racehorse.

When the player wants to interrupt the raising of the racehorse, raising information at the time of interruption is updated as occasion calls by reading a dedicated card-type recording medium (hereinafter referred to as an "entry card") and by linking the information with a player ID. When the player resumes the game, the most-recent raising information recorded in the card-type recording medium is used, and the raising from the interrupted point onward is continued.

Fig. 1 is an external perspective view of a game machine implementing the foregoing game.

A game machine 1 includes a racing field 10 provided substantially at the central part, a plurality of stations 20 provided so as to surround the field 10, a board 30 for displaying odds, race results, and other guidance information, and a speaker system 40 for outputting voices such as race running announcements and the like. In addition, the game machine 1 further includes the game progress control device (not shown) for

controlling race development. The game progress control device is described hereinafter.

5 The field 10 is provided with two types of tracks 12 and 13, which include a starting gate 11. By running a plurality of racehorses on the tracks 12 and 13, races are held. The tracks 12 and 13 cause each of the racehorses to run in a manner in which the results of processing the current ability parameters using different processes are reflected. At the same time, variable factors of the ability parameters, which differ in accordance with the running, are provided for each of the racehorses.

In the present embodiment, as shown in the drawing, the tracks 12 and 13 are concentrically formed. The outer track 12 is a track simulating a turf course (hereinafter referred to as a "turf track"), and the inner track 13 is a track simulating a dirt course in which soil is exposed (hereinafter referred to as a "dirt track").

20 In the case of actual horse racing, a turf course is generally maintained so that a horse can run a race while exerting its maximum running ability at that time. Since soil characteristics such as viscosity change in accordance with the climate, a dirt course is not maintained in a manner similar to the turf course. However, there are horses which can exert their abilities in a more efficient manner when running on the dirt

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course. In addition, when a horse runs only on the turf course, a burden is put on the horse's legs, which may cause injuries. When a horse runs only on the turf course, only a minimal effect may be produced on the training of the horse's body. In such cases, the horse is occasionally caused to run on the dirt course to train its body, and then the horse is again caused to run on the turf course.

Following the actual horse racing, in the present embodiment, the turf track 12 and the dirt track 13 are provided concentrically in the same field. Accordingly, the tracks 12 and 13 can provide different variable factors of the ability parameters of each racehorse. A player confirms the running conditions of a racehorse and determines whether the player's horse is suitable for the turf track or the dirt track. It is also possible to realize a game pattern in which the player initially causes a racehorse to run on the dirt track 13 to train its body and subsequently causes the racehorse to compete with other horses on the turf track 12.

A passageway is formed between the tracks 12 and 13 so that racehorses can enter and exit between the tracks 12 and 13. A single type of racehorse can participate in races held on two tracks. In conventional and general horse racing game systems, when there are two types of tracks,

it is necessary to prepare two types of racehorses because the structure of a racehorse is uniquely determined according to the type of track. In the present embodiment, only a single type of racehorse is necessary, and hence operating costs are reduced.

Each of the stations 20 includes a display 21 for displaying various screens changing in accordance with the progress of the horse racing game and a touch panel 22 provided on a display surface of the display 21. When the player touches a predetermined position on the game screen displayed on the display 21 in accordance with instructions on the game screen, the touch panel 22 detects the touched position. This enables the player to enter corresponding data.

Fig. 2 illustrates an example of a race selection screen among the screens displayed on the display 21. The race selection screen enables the player to select a race in which the player wants a player's racehorse to participate. The names of races are displayed in a region 201 at the upper right-hand side of the race selection screen. In this example, information such as a prize and racing qualifications are displayed for each race. A list of racehorses already owned by the player is displayed in a region 202 at the lower side of the race selection screen. In this drawing, eight

horses owned by the player are displayed. For each horse, sex (male or female), age, acquired prizes, and condition are displayed, and the player can easily read general information on each horse. A region 203 on the right of the region 202 displays, according to each of the races displayed in the region 201, messages such as "eligible" indicating that the corresponding horse can participate in that race, "unqualified" indicating that the corresponding horse is not qualified to run that race, and "closed" indicating that the registration for that race has already been closed. In this way, the player can easily understand whether each horse is eligible for what race.

Detailed information on the currently-selected horse is displayed in a region 204 above the region 202. In this example, the appearance of the horse, dam's name, sire's name, damsire's name, growth type, distance aptitude, past record, speed parameter, and stamina parameter are displayed.

In this example, between the regions 201 and 203, messages indicating whether the currently-selected horse displayed in the region 204 is eligible for a particular race are displayed based on the messages displayed in the region 203. Concerning a race for which the horse is eligible, the number to be paid in a bet by the player is displayed. For example, in Fig. 2, the race on the

farthest left has already been closed, and hence the horse cannot be registered for that race. Concerning the race at second from the left, the horse can be registered for that race by paying a bet of 10. Concerning the remaining five races, the horse can be registered for the respective races by paying a bet of 5.

Fig. 3 illustrates an example of a bet screen displayed on the display 21. The bet screen is a screen referred to when the player purchases a ticket for a race. In a region 301 at the upper left-hand side of the bet screen, the name of a race, prizes, a place where that race is held, and a racing distance are displayed. At the upper right-hand side of the bet screen, a region 302 is provided displaying information such as the names of horses running the race, jockeys, and the like. At the lower side of the bet screen, a region 303 is provided displaying odds on each ticket. The region 303 displays odds on various types of tickets including quinella, win, box, and the like.

Referring back to Fig. 1, each of the stations 20 is further provided with a medal insertion hole 23 into which the player inserts medals, a medal ejection hole 24 from which medals are paid off in accordance with the game result, and a card insertion slot 25 into which the entry card is inserted.

The game progress control device included in the game machine 1 is described next.

The game progress control device controls (and monitors) movements of racehorses using wireless signals and manages information concerning players participating in the game and racehorses raised by each of the players.

Fig. 4 is a diagram of the functional structure of the game progress control device.

The game progress control device of the present embodiment is implemented by a computer with a data recording region and a wireless communication unit 65. An operating system of the computer reads and executes a predetermined program, thereby forming functional blocks, namely, a main controller 61, a station controller 62, a racehorse data manager 63, and a player data manger 64.

The main controller 61 controls the mechanical operation of the game machine 1 and the overall movement of each racehorse, and performs overall information management concerning game progress. For example, the main controller 61 performs arithmetic processing such as odds computation in accordance with the number of bets made by players.

The station controller 62 separately controls the operation of each of the stations 20. The racehorse data manager 63 manages information

concerning racehorses appearing in the game progress, stables, jockeys, and the like. The player data manager 64 is a type of database system for storing raising information according to each player, which includes racehorse's raising conditions entered by the player and setting information required for the game progressing, as "player data" inherent in the player, while linking the player data with a player ID.

In the station controller 62, the current date information is automatically updated under the management of the station controller 62. When the entry card is inserted into the card insertion slot 25, it is determined whether date information recorded in the card matches the date information in the station controller 62 or not. When the two pieces of date information match each other, the player data can be retrieved from the player data manager 64 via the main controller 61. This efficiently avoids the occurrence of problem of "passing off" by a third person other than the player in which the third person obtains the player ID, passes off as the player, and abuses the player data.

The operation of the horse racing game system with the foregoing arrangement is described next.

In the horse racing game system, an entry card is issued at an arcade for maintaining and managing

the system. The entry card can be used only in the arcade.

In other words, an entry gate with an entry-card reader/writer is installed at an information counter at the arcade or the like. A new entry card is issued for a new player. In doing so, personal information (such as player ID) of the player is registered. When the player exits from the arcade, the player returns the entry card to the information counter or the like. When the player makes a second visit to the arcade, the player receives the entry card that the player previously used from the information counter or the like.

When the same player re-enters the arcade to play the horse racing game system, the entry card is inserted into a medium storage device at the entry gate by a staff at the information counter or by the player. At the entry gate, the validity of using the inserted entry card is determined. This is determined whether the player inherent information registered by the player when the entry card was issued matches inherent information identified on that day. When the player ID is registered as the inherent information, and when the ID entered via the touch panel 22 matches the registered player ID, it is determined that the validity of the entry card is verified. Subsequent

to the verification of the validity, the current date information is recorded in the recording region in the entry card, and then the entry card is returned to the player. When the validity is not verified, error processing is performed, and the entry card is ejected.

The player carries the entry card in which the date information is recorded and sits opposite the desired station 20. The player inserts the entry card into the card insertion slot 25 of the station 20. The current date information is set in the game machine 1. When it is determined that the set current date information matches the date information recorded in the entry card, the player data is read from the player data manager 64, thereby forming an environment enabling the station 20 to play (again) the game.

While the game is being played, a region for switching the mode among various game playing modes for the station 20 is reserved in the screen of the display 21, as indicated by button images displayed on the right in Fig. 2. The mode is switched among these modes by the player selecting a desired button image displayed on the display 21, and hence a screen corresponding to the selected mode is displayed on the display 21.

Although the player can participate in a race only using a ticket-purchase mode, in this example,

the player selects a horse-raising mode ("raise" button). Based on the information under the management of the racehorse data manager 63, the player pays the predetermined number of medals to purchase a horse from among a plurality of horse candidates. The player raises the horse and participates in a race using the raised horse in the ticket-purchase mode.

When the horse is purchased by the player, the game machine 1 displays a stable selection screen on the display 21. The stable selection screen displays three types of stable selection buttons, including a normal stable, a stamina stable, and a speed stable. If the player selects the stamina stable, the horse will become a long-distance horse; if the player selects the speed stable, the horse will become a short-distance horse; and if the player selects the normal stable, the horse will become an average horse which is not raised to be either the long-distance type nor the short-distance type (the corresponding ability parameters are changed). After the stable has been selected, a horse's name selection screen is displayed on the display 21. Once the horse's name is selected by the player from among a plurality of horses' names, the selected horse's name is audio-output when the horse runs a race and when a running commentary of the race is given.

When the foregoing selections have been performed, various pieces of information on the horse selected by the player are automatically stored as part of the player data in the player data manager 64. If information on the same horse is included under the same player ID, the contents of the information are updated.

After the foregoing selections are completed, the ticket-purchase mode is activated.

In this mode, betting by the player, which is shown in Fig. 3, is performed. Concerning the betting, the player purchases a ticket for the horse owned by the player and enjoys a race. On the bet screen displayed on the display 21, a region for displaying race names is formed. By operating buttons formed in the region, the player selects the race. Once the race is selected, the player can select a jockey who is to ride the registered horse, which will not be described in the present description.

The player can select a training process based on the player's intentions within the period from the start of the betting to the start of the subsequent betting. Specifically, the player can train the horse by paying medals for the training, in addition to the betting for the race. In general, the larger the number of medals, the more improved the running ability of the horse becomes

after being trained. The probability of the horse winning in the race is thereby increased. In doing so, the player can foster the running ability of the horse by putting money for the horse, and hence the player can appreciate the joy of raising the horse to be a stronger racehorse. The training is forcedly terminated at the start of the subsequent betting. The number by which the horse can be trained is limited for each race. It is impossible to ignore the passage of time, which can be assumed by the cycle of races, and hence the horse cannot be rapidly improved. This ensures the reality of the speed at which the horse is improved.

When the game is terminated (or interrupted) by the player, information concerning the abilities of the horse that has been trained and raised up until that time is stored as part of the player data in the player data manager 64. If the information on the same horse is already stored under the same player ID, the contents of the information are updated. Subsequently, the entry card is ejected, and the processing for the player is terminated.

According to the present embodiment, two types of tracks, namely, the turf track 12 and the dirt track 13, are provided. The track is arbitrarily selected from among these tracks, and the horse runs a race on the selected track. While enjoying

the race based on the current running ability of the horse owned by the player, the player can improve a specific ability or use that ability at arbitrary time. This considerably enhances enjoyment compared with the conventional type of game system.

Since the raising information given by the player is under the management of the game machine 1 (player data manager 64), which is the site of the game, the raising information is protected from being altered by the player or by a third person. However, if the security is sufficiently ensured by the entry card, the raising information can be stored in the entry card. In this case, the raising information in the entry card can be used to continue with the game, and hence there is an advantage in that the game machine to be used in continuing with the game is not limited to a particular one. Accordingly, the player can continue with the game for fun at a different place where the game machine is installed.

In the above example, two types of tracks, namely, the turf track 12 and the dirt track 13, are provided on the field 10. Alternatively, it is possible to use a set of a track maintained so as to cause each racehorse to run at a steady pace in which the current ability parameters are maximized and a track formed to obstruct the steady-pace

running. It is also possible to use a set of a flat track maintained not to obstruct the running of each racehorse and a steeplechase track on which obstacles are arranged on part of the track.

5 In the present embodiment, it is assumed that there is only one game machine 1. When there is a plurality of game machines, and when each game machine is independent, the player cannot continue with the game unless the player always uses the same game machine. In order to solve this problem, a plurality of game machines can be interconnected via a communication system, and player data are transmitted between one another. Accordingly, the player can continue with the game by using any one of the game machines.

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20 Although the present embodiment describes the case in which the game machine 1 is mechanically constructed, the present invention is also applicable to a case in which the game machine is electronically formed. For example, the turf track 12 and the dirt track 13 can be formed on the field 10 by image processing using holography. Since the turf track 12 and the dirt track 13 are electronically formed, the turf conditions (depth, hardness, roughness, and the like) of the turf track 12 and the soil conditions (viscosity and the like) of the dirt track 13 can be arbitrarily

adjusted. This is expected to further enhance the enjoyment of the game.

The present invention is applicable not only to the horse racing game, but also to other games with interruption, such as games in which a player finds enjoyment in tuning up a racing car or improving the abilities of a cycle racer. In the description, the word "raising" encompasses the concept of time-series improvement of the running ability of an object appearing in a game with interruption or the concept of controlling the running ability. The phrase "raising information" can be interrupted as game information including a game record of this type of game.

As is obvious from the foregoing description, according to the present invention, a racing field is formed by including a plurality of field regions so that a running model runs a race based on the current ability parameters, in accordance with the respective regions. In doing so, the running model is provided with variable factors of the ability parameters, which are made different according to the running. It is thus advantageous in that a player can enjoy a process of changing the ability parameters of the running model.